



Beck Anxiety Inventory®

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Introduction

The *Beck Anxiety Inventory* (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21- item scale that measures the severity of anxiety in adults and adolescents. Aaron T. Beck and his associates at the Center for Cognitive Therapy, University of Pennsylvania School of Medicine, Department of Psychiatry, developed the BAI to assess symptoms of anxiety.

The 1993 Edition of this Manual recommends different scoring guidelines than previous editions. The diagnostic ranges and associated descriptive labels have been revised by Dr. Beck based on his extensive experience with outpatients with anxiety disorders at the Center for Cognitive Therapy (CCT) in Philadelphia. The adjustments were slight. Scores of 0-7 are now described as "Minimal" rather than "Normal." Scores of 8-15 are now referred to as "Mild," whereas scores of 10-18 were previously referred to as "Mild-Moderate." Scores of 16-25 are now classified as "Moderate," whereas scores of 19-29 were previously classified as "Moderate-Severe." Finally, scores of 26-63 are now described as "Severe," whereas scores of 30-63 were previously described as "Severe."

Background

Anxiety and depression syndromes represent the most prevalent mental disorders treated by mental health practitioners (Williams & Poling, 1989); anxiety disorders occur in 2-5% of the general population (Reich, 1986). Although a number of studies (Barlow, DiNardo, Vermilyea, Vermilyea, & Blanchard, 1986; Beck, Brown, Steer, Eidelson, & Riskind, 1987; Breier, Charney, & Heninger, 1985; Dobson, 1985; Foa & Foa, 1982; Stavrakaki & Vargo, 1986) were attempts to disentangle the affective, behavioral, and somatic symptoms exhibited by persons with anxiety and depression, the results of these studies are equivocal. Therefore, given that anxiety and depression frequently coexist (Clark, 1989; Watson & Kendall, 1989), it is not surprising that the results from instruments designed to measure the severity of anxiety or depression are highly correlated with one another (Beck, Epstein et al., 1988; Gotlib & Cane, 1989; Lipman, 1982; Snaith & Taylor, 1985). The BAI was constructed to measure symptoms of anxiety which are minimally shared with those of depression, such as those symptoms measured by the revised Beck Depression Inventory (BDI; Beck & Steer, 1987).

Development

The items of the BAI were drawn from three earlier self-report instruments that measure various aspects of anxiety. Used for a number of years at the Center for Cognitive Therapy, these instruments are the Anxiety Check List (ACL; Beck, Steer, & Brown, 1985), PDR Check List (PDR; Beck, 1978), and the Situational Anxiety Check List (SAC; Beck, 1982). The ACL evaluates the severity of anxiety in depressed patients; the PDR measures the common side effects of antianxiety and antidepressant medications described in the Physician's Desk Reference (Medical Economics, 1977); and the SAC appraises the severity of somatic and cognitive symptoms of anxiety in general and in the context of two specific situations-(1) public speaking and (2) another anxiety-provoking situation provided by the patient. The sequential system of scale construction used in the development of the BAI, which is based on Jackson's (1970) approach, is described in detail by Beck, Epstein et al. (1988) and will not be repeated here.

A sample of 810 outpatients of the Center for Cognitive Therapy who had predominantly mood and anxiety disorders and who had completed the ACL, PDR, and SAC, was used by Beck, Epstein et al. (1988) to identify an initial pool of 86 symptoms of anxiety. Of these 86 symptoms, 20 were eliminated because the items reflected identical or similar content. Principal-factor analyses resulted in the elimination of an additional 19 symptoms. For the remaining 47 symptoms, a series of item analyses were conducted, and 37 symptoms were retained for further analysis. A new sample of 116 outpatients being evaluated at the Center then completed the 37-item scale. Subsequent item analyses further reduced the number of symptoms to 21, and the 21-item version was finally administered to a new group of 160 outpatients. Data on these patients are reported in subsequent sections of this Manual.

Description and Content of Scale

The BAI consists of 21 descriptive statements of anxiety symptoms which are rated on a 4-point scale with the following correspondence: "Not at all" (0 points); "Mildly; it did not bother me much" (1); "Moderately; it was very unpleasant, but I could stand it" (2); and "Severely; I could barely stand it" (3). The 21 items are "Numbness or tingling," "Feeling hot," "Wobbliness in legs," "Unable to relax," "Fear of the worst happening," "Dizzy or lightheaded," "Heart pounding or racing," "Unsteady," "Terrified," "Nervous," "Feelings of choking," "Hands trembling," "Shaky," "Fear of losing control," "Difficulty breathing," "Fear of dying," "Scared," "Indigestion or discomfort in abdomen," "Faint," "Face flushed," and "Sweating (not due to heat)."

Appropriate Uses

The BAI measures the severity of self-reported anxiety. Because the BAI was developed with adult psychiatric outpatients, it should be used cautiously with other clinical populations. A few adolescents were included in the samples assessed by Beck, Epstein et al. (1988), but the reliability and validity of the BAI for adolescents have not been directly tested. Furthermore, only one British study (Dent & Salkovskis, 1986) has provided data about the BAI with normal adults, and the BAI's potential for detecting clinical anxiety in normal adults requires further study. Therefore, the most appropriate use for the BAI is that with adult psychiatric outpatients over the age of 17 years.

User Qualifications

The BAI may be administered and scored by paraprofessionals, but it should be used and interpreted only by professionals with appropriate clinical training and experience according to the guidelines established by the American Psychological Association's *Standards for Educational and Psychological Tests* (1985). Patients with anxiety disorders frequently have co-morbid mood disorders, and some patients with mood disorders, in turn, may report suicidal ideation. Therefore, the clinician reviewing the BAI data must be able to respond with a full range of appropriate therapeutic interventions, to a patient's anxiety disorder, as well as to the patient's depressive or suicidal ideation.

Administration and Scoring

Administration

Testing Conditions

The BAI presents few difficulties in administration. The testing environment in which the BAI is given must provide the patient with sufficient illumination for reading and be quiet enough to afford concentration. Obviously, the test administrator must determine beforehand whether or not a patient can comprehend the BAI's item content.

Administration Time

The BAI requires between 5 and 10 minutes to complete when it is self-administered. Oral administration generally takes 10 minutes.

Directions for Administration

Self-Administration. In addition to spaces for the person's name and the testing date, the BAI record form includes the following instructions:

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

Oral Administration. If the test administrator deems that a respondent needs assistance in completing the BAI, the following instructions should be used:

This questionnaire contains 21 symptoms. I will read each symptom aloud one by one. After each symptom that I read, I want you to tell me if you were not bothered at all, mildly bothered, moderately bothered, or severely bothered by this symptom during the past week, including today. That includes right now. "Mildly" means that the symptom did not bother you much; "moderately" means that you were bothered very much by the symptom; and "severely" means that you could barely stand it.

After these instructions are given, a copy of the BAI is given to the respondent who is told, "Here is a copy for you so that you can follow along as I read." Sometimes a respondent will take the initiative, read the symptoms ahead of the test administrator, and describe how much he or she was bothered by each symptom. If necessary, the administrator may tactfully encourage the respondent to reflect sufficiently before making choice. At the end of testing, a careful inspection of all of the ratings will insure that no responses have been omitted. The administrator should ask the respondent to rate any omitted responses. If the person explains that he or she is unsure, the administrator should tell the person to make a rating base on his or her first impression.

Response Sets. If a person gives the same rating to each symptom statement, then he or she should be told that a person seldom experiences all of the symptoms in exactly the same way and that perhaps he or she might wish to reconsider some of the ratings.

Scoring

Guidelines

The BAI total score is the sum of the ratings given by the examinee for the 21 symptoms. Each symptom is rated on a 4-point scale ranging from 0 to 3. The maximum score is 63 points.

The scoring guidelines recommended in the 1993 Edition of the Manual differ slightly from those suggested in previous editions. The interested reader should refer to the Introduction section of the Manual for a comparison of current and previous scoring guidelines.

The BAI total score ranges are recommended for interpreting the intensity of self-reported anxiety. Total scores from 0-7 points are considered to reflect a minimal level of anxiety; scores of 8-15 indicate mild anxiety; scores of 16-25 reflect moderate anxiety; and scores of 26-63 indicate severe anxiety. Research addressing the sensitivity and specificity of these score ranges for detecting clinical anxiety, however, has not yet been conducted. Furthermore, some data suggest that the BAI total scores for women with anxiety disorders may be an average of 4 points higher than those for men with anxiety disorders. Such a gender difference in self-descriptions of anxiety symptoms should be taken into consideration when men's and women's levels of anxiety are compared and especially when the scores are near the upper ends of the ranges. A study of outpatients diagnosed as having anxiety disorders, reported later in this Manual, indicated that BAI total scores are also inversely related to age; younger patients report more anxiety than do older patients.

The clinician should also view the four BAI score ranges in light of the sample and the purposes for which the BAI is being used. If the examiner's purpose is to maximize detection of persons with anxiety, then the upper level of each range should be lowered to minimize false negatives. This method would be useful in screening for possible cases of anxiety. To reduce the number of false positives, the examiner should raise the upper levels of each range. This method is used in research for which one wishes to obtain as pure a sample as possible of persons with anxiety disorders.

Interpretation

Because a BAI total score yields only an estimate of the overall severity of anxiety being described by a person, the clinician must consider the other aspects of psychological functioning exhibited by the person, particularly any co-morbid symptoms of depression. Patients with anxiety symptoms frequently complain of depressive symptoms, and the presence of suicidal ideation is an indicator of suicidal risk (Beck, 1967, 1976). For these reasons, the administration of other scales, such as the BDI (Beck & Steer, 1987) and the *Beck Hopelessness Scale* (BHS; Beck & Steer, 1988), in conjunction with the BAI may be useful.

The examiner should also closely inspect the BAI score for a pattern of symptom complaints. For example, a patient with predominantly somatic complaints may be suffering from an undetected medical condition. Furthermore, cluster analyses of clinical data (described on pages 15-18) revealed four distinct symptom clusters, which may assist the examiner in making a differential diagnosis.

Psychometric Characteristics

Because the first article about the BAI was published in 1988 (Beck, Epstein et al.), only a few additional studies address the BAI's psychometric characteristics. Dent and Salkovskis (1986) offer data about the BAI with nonclinical populations. (In their article, they call the BAI the *Beck Anxiety Check List - Severity Subscale*, the name used by the Center for Cognitive Therapy during the final phases of pilot testing.) Attempting to replicate some of Beck, Epstein et al.'s (1988) reliability and validity findings, Fydrich, Dowdall, and Chambless (1990) used the BAI with outpatients with anxiety disorders.

It is important to note that the patients in the studies by Beck, Epstein et al. (1988), Fydrich et al. (1990), and for this Manual were diagnosed according to either the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* (DSM-III; 1980) or *Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised* (DSM-III-R; 1987). Semi-structured interviews based on the Structured Clinical Interview for DSM-III (Spitzer & Williams, 1985) or the DSM-III-R (Spitzer, Williams, & Gibbon, 1987) were used. Therefore, their ***BAI findings should be applicable to inpatients diagnosed as having DSM-III or DSM-III-R disorders.***

Characteristics of Sample Groups

Scale-Development Sample

As described in the Background and Development sections, Beck, Epstein et al. (1988) drew three successive samples of psychiatric outpatients. The total number of patients was 1,086 and included 456 men (42.0%, mean age = 36.4 years, SD = 12.4) and 630 women (58.0%, mean age = 35.7 years, SD = 12.1). The patients were diagnosed as having predominantly mood and anxiety disorders, but a variety of other disorders were represented. Fewer than 1% of the sample were diagnosed as psychotic.

In the final subsample of 160 outpatients studied extensively by Beck, Epstein et al. (1988) for their reliability and validity analyses, 40 outpatients (25.0%) were diagnosed as having primary major depression, 11 (6.9%) as having dysthymic or atypical depression, 45 (28.1 %) as having panic with agoraphobia, 18 (11.2%) as having agoraphobia with panic attacks, 12 (7.5%) as having social or simple phobia, 18 (11.2%) as having generalized anxiety, and 16 (10.0%) as having miscellaneous nonanxiety or nondepression disorders, such as academic problems and adjustment disorders.

Clinical Samples

Fydrich et al. (1990) studied two samples of outpatients diagnosed as having DSM-III-R anxiety disorders. The first sample included 40 patients (53% female) with a mean age of 34.9 years. The diagnostic composition was 52.5% panic disorder with agoraphobia, 22.5% panic disorder without agoraphobia, 12.5% simple phobia, 7.5% obsessive-compulsive disorder, 2.5% generalized anxiety disorder, and 2.5% not-otherwise-specified anxiety disorder.

The second sample studied by Fydrich et al. (1990) included 71 outpatients (65% female) with a mean age of 35.9 years. The diagnostic composition was 69.0% panic disorder with agoraphobia, 15.5% panic disorder without agoraphobia, 9.9% simple phobia, 2.8% obsessive-compulsive disorder, 1.4% generalized anxiety disorder, and 1.4% not-otherwise-specified anxiety disorder.

The data presented in this Manual and shown in Tables 2-6 are based on a sample of 393 outpatients evaluated at the Center for Cognitive Therapy between January 1985 and August 1989. The sample included 236 women (60.1 %) and 157 men (39.9%). The mean age was 37.1 years (SD = 11.3). The sample had the following diagnostic composition: 95 (24.2%) panic with agoraphobia, 93 (23.7%) panic without agoraphobia, 4 (1.0%) agoraphobia without panic attacks, 44 (11.2 %) social phobia, 19 (4.8%) simple phobia, 26 (6.6%) obsessive-compulsive, 2 (0.5%) posttraumatic stress disorders, 90 (22.9%) generalized anxiety, and 20 (5.1 %) not-otherwise-specified anxiety disorder.

Nonclinical Samples

In England, Dent and Salkovskis (1986) used the BAI with three samples: 65 university students (75% women) with a mean age of 20.1 years (SD = 2.6); 142 medical students (51 % women) with a mean age of 18.9 years (SD = 1.2); and 36 nonstudents (78% women) with a mean age of 28.6 years (SD = 12.9).

Reliability

Internal Consistency

With their diagnostically mixed sample of 160 outpatients, Beck, Epstein et al. (1988) reported that the BAI had high internal consistency reliability (Cronbach coefficient alpha = .92), and Fydrich et al. (1990) found a slightly higher level of internal consistency (coefficient alpha = .94) in 40 patients diagnosed as having DSM-III-R anxiety disorders. The coefficient alphas for the DSM-III-R anxiety disorder groups reported in this Manual were also quite high (see Table 2).

Item Analyses

Table 1 presents the means, standard deviations, and corrected item-total correlations and reliability that Beck, Epstein et al. (1988) reported for the 21 BAI symptoms in their diagnostically mixed sample of 160 outpatients. The corrected item-total correlations ranged from .30 to .71.

Table 2 presents data for the five diagnostic groups with the highest representation ($n > 25$) in the outpatient population diagnosed as having DSM-III anxiety disorders (described on page 8). For these five subsamples, the magnitudes of the corrected item-total correlations were significant beyond the .05 level, one-tailed test, even after Bonferroni adjustments were applied.

Table 1. Means Standard Deviations, and Correct Item-Total Correlations for the Scale-Development Sample

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Numbness or tingling	.68	.80	.30
Feeling hot	.86	.87	.63
Wobbliness in legs	.61	.83	.54
Unable to relax	1.89	.78	.61
Fear of the worst happening	1.74	1.03	.59
Dizzy or lightheaded	1.00	.95	.63
Heart pounding or racing	1.18	.98	.55
Unsteady	.96	.99	.71
Terrified	1.15	1.14	.63
Nervous	1.89	.84	.60
Feelings of choking	.39	.80	.46
Hands Trembling	.77	.85	.55
Shaky	1.01	.94	.67
Fear of losing control	1.54	1.07	.64
Difficulty breathing	.87	1.05	.53
Fear of dying	.90	1.11	.50
Scared	1.66	.97	.68
Indigestion or discomfort in abdomen	1.10	.98	.42
Faint	.68	.91	.67
Face flushed	.69	.85	.59
Sweating (not due to heat)	.80	.97	.60
Total Score	22.35	12.36	
Reliability ^a			.92

Note. $N = 160$. From "An Inventory for Measuring Clinical Anxiety: Psychometric Properties" by A.T. Beck, N. Epstein, G. Brown, & R.A. Steer, 1988, *Journal of Consulting and Clinical Psychology*, 56, p. 895. Copyright 1988 by American Psychological Association. Adapted by permission.

^a Based on Cronbach's Coefficient Alpha.

Test-Retest

A subsample of 83 outpatients from Beck, Epstein et al. 's (1988) study completed the BAI one week after their intake evaluation and before starting cognitive therapy (Beck, Rush, Shaw, & Emery, 1979). The correlation between intake and one-week BAI scores was .75 ($p < .001$).

Validity

Five types of validity for the BAI are considered: content, concurrent, construct, discriminant, and factorial.

Content Validity

The procedures used to ensure that the BAI comprises symptoms considered to represent anxiety are described in the Development section. Furthermore, the BAI's content corresponds to the symptom criteria presented in the DSM-III-R as guidelines for diagnosing patients with anxiety disorders, most notably those symptoms listed for the panic and generalized anxiety disorders.

Table 2. Means Standard Deviations, and Correct Item-Total Correlations for the BAI Clinical Sample

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Panic Disorder with Agoraphobia (<i>N</i> = 95)			
Numbness or tingling	.83	.83	.54
Feeling hot	1.22	.91	.52
Wobbliness in legs	.94	.99	.48
Unable to relax	1.96	.86	.70
Fear of the worst happening	1.80	1.02	.63
Dizzy or lightheaded	1.42	1.00	.68
Heart pounding or racing	1.63	.88	.50
Unsteady	1.29	.99	.70
Terrified	1.38	1.15	.68
Nervous	1.86	.83	.69
Feelings of choking	.59	.95	.38
Hands Trembling	.98	.97	.64
Shaky	1.23	.92	.73
Fear of losing control	1.74	1.04	.62
Difficulty breathing	1.12	1.06	.54
Fear of dying	1.13	1.10	.52
Scared	1.83	.91	.73
Indigestion or discomfort in abdomen	1.26	.97	.52
Faint	.99	1.07	.65
Face flushed	1.03	.97	.51
Sweating (not due to heat)	1.04	.94	.61
Total Score	27.27	13.11	
Reliability ^a			.93

^a Based on Cronbach's Coefficient Alpha.

Table 2. Means, Standard Deviations, and Corrected Item-Total Correlations for the BAI Clinical Sample (*Continued*)

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Panic Disorder Without Agoraphobia (<i>N</i> = 93)			
Numbness or tingling	.90	.85	.38
Feeling hot	1.12	.97	.49
Wobbliness in legs	.83	.92	.53
Unable to relax	2.01	.88	.59
Fear of the worst happening	2.06	1.01	.64
Dizzy or lightheaded	1.44	.98	.58
Heart pounding or racing	1.55	1.04	.68
Unsteady	1.30	1.08	.66
Terrified	1.49	1.21	.66
Nervous	2.01	.98	.47
Feelings of choking	.80	1.09	.50
Hands Trembling	1.10	1.00	.69
Shaky	1.40	1.02	.70
Fear of losing control	1.94	1.08	.66
Difficulty breathing	1.35	1.16	.51
Fear of dying	1.35	1.30	.50
Scared	1.97	1.04	.59
Indigestion or discomfort in abdomen	1.26	1.01	.42
Faint	1.01	1.08	.66
Face flushed	.78	.97	.52
Sweating (not due to heat)	1.13	1.07	.49
Total Score	28.81	13.46	
Reliability ^a			.92

^a Based on Cronbach's Coefficient Alpha.

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Social Phobia (<i>N</i> = 44)			
Numbness or tingling	.45	.82	.50
Feeling hot	.82	.90	.56
Wobbliness in legs	.41	.76	.55
Unable to relax	1.64	.89	.63
Fear of the worst happening	1.05	1.06	.59
Dizzy or lightheaded	.75	.89	.73
Heart pounding or racing	1.30	.98	.48
Unsteady	.73	.90	.79
Terrified	.84	1.06	.63
Nervous	1.59	.90	.58
Feelings of choking	.43	.85	.29
Hands Trembling	.89	1.08	.69
Shaky	1.00	1.01	.72
Fear of losing control	.98	1.09	.59
Difficulty breathing	.43	.82	.50
Fear of dying	.20	.59	.38
Scared	1.39	.95	.66
Indigestion or discomfort in abdomen	.82	.97	.49
Faint	.32	.60	.31
Face flushed	.82	.90	.42
Sweating (not due to heat)	.93	1.07	.43
Total Score	17.77	11.64	
Reliability ^a			.91

^a Based on Cronbach's Coefficient Alpha.

Table 2. Means Standard Deviations, and Correct Item-Total Correlations for the BAI Clinical Sample (*Continued*)

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Obsessive-Compulsive Disorder (<i>N</i> = 90)			
Numbness or tingling	.69	.84	.61
Feeling hot	.96	1.04	.67
Wobbliness in legs	.77	.99	.51
Unable to relax	2.04	.82	.68
Fear of the worst happening	1.92	.98	.56
Dizzy or lightheaded	.85	.83	.37
Heart pounding or racing	.85	.97	.60
Unsteady	1.04	1.08	.73
Terrified	1.38	1.24	.68
Nervous	1.77	1.03	.30
Feelings of choking	.27	.83	.30
Hands Trembling	.58	.90	.69
Shaky	1.00	1.06	.77
Fear of losing control	1.35	1.35	.72
Difficulty breathing	.54	.90	.44
Fear of dying	.69	1.01	.29
Scared	1.85	1.08	.76
Indigestion or discomfort in abdomen	1.08	.84	.20
Faint	.50	.91	.31
Face flushed	.77	.91	.39
Sweating (not due to heat)	.81	1.17	.61
Total Score	21.69	12.42	
Reliability ^a			.91

^a Based on Cronbach's Coefficient Alpha.

Item	<i>M</i>	<i>SD</i>	<i>r</i>
Generalized Anxiety Disorder (<i>N</i> = 90)			
Numbness or tingling	.42	.69	.18
Feeling hot	.76	.80	.34
Wobbliness in legs	.52	.78	.54
Unable to relax	1.92	.80	.57
Fear of the worst happening	1.50	.97	.45
Dizzy or lightheaded	.90	.95	.55
Heart pounding or racing	1.07	.95	.41
Unsteady	.70	.84	.55
Terrified	.91	1.06	.52
Nervous	1.66	.88	.39
Feelings of choking	.37	.69	.23
Hands Trembling	.64	.75	.38
Shaky	1.02	.85	.57
Fear of losing control	1.11	.99	.49
Difficulty breathing	.52	.80	.34
Fear of dying	.56	.91	.40
Scared	1.53	.94	.58
Indigestion or discomfort in abdomen	1.13	.97	.37
Faint	.39	.68	.43
Face flushed	.54	.75	.26
Sweating (not due to heat)	.66	.85	.40
Total Score	18.83	9.08	
Reliability ^a			.85

^a Based on Cronbach's Coefficient Alpha.

Concurrent Validity

The correlations of the BAI with other self-report and clinical rating scales used to measure the severity of anxiety are shown in Table 3. The 160 patients in the Beck, Epstein et al. (1988) study were also administered the *Hamilton Anxiety Rating Scale-Revised* (Hamilton, 1959) as reconstructed by Riskind, Beck, Brown, and Steer (1987). The correlation was .51 ($p < .001$). The correlation of the BAI with the anxiety subscale of the *Cognition Check List* (CCL-A; Beck, Brown, Steer, Eidelson, & Riskind, 1987), which measures the frequency of dysfunctional cognitions related to anxiety, was also .51 ($p < .001$).

Fydrich et al. (1990) reported that the BAI was significantly correlated with the Trait ($r = .58$, $p < .001$) and State ($r = .47$, $p < .01$) subscales of the *State-Trait Anxiety Inventory* (Form Y) (STAI; Spielberger, 1983) and with the mean 7-day anxiety rating ($r = .54$, $p < .001$) of the *Weekly Record of Anxiety and Depression* (WRAD; Barlow & Cerny, 1988).

In summary, the magnitudes of the correlation coefficients shown in Table 3 demonstrate that the BAI is not only significantly but also substantially related to other accepted measures of both self-reported and clinically rated anxiety.

Table 3. Correlations of the BAI with Selected Other Instruments

Study/ Instrument	<i>r</i>
Beck et al. (1988) (N = 160)	
HARS-R	.51***
CCL-Anxiety	.51***
HRSD-R	.25*
BDI	.48***
CCI-Depression	.22*
BHS	.15
Fydrich et al. (1990) (N = 71)	
STAI Trait	.58***
STAI State	.47**
WRAD-Anxiety	.54***
BDI	.50***
WRAD-Depression	.38**
Dent & Salkovskis (1986) (N = 243)	
BDI	.61***
MOC	.41***

Note. Bonferroni adjustment made for each study.

* $p < .05$, ** $p < .01$, *** $p < .001$

Construct Validity

Other measures of anxiety have repeatedly been reported to be highly related to measures of depression (Gotlib & Cane, 1989). One would anticipate, therefore, that the BAI would also be significantly related to measures of depression, even though the BAI was constructed to minimize such relationships. Table 3 presents the correlations of the BAI with both self-report and clinical ratings of depression. For example, in their study of 160 patients, Beck, Epstein et al. (1988) found that the correlation between the BAI and the *Hamilton Psychiatric Rating Scale for Depression-Revised* (HRSD-R; Hamilton, 1960) as reconstructed by Riskind et al. (1987) was significant ($r = .25, p < .05$), whereas the correlation between the BAI and BDI (Beck & Steer, 1987), was significantly higher ($r = .48, p < .001$). The correlation of the BAI with the depression subscale of the CCL (Beck et al., 1987), which measures the frequency of dysfunctional cognitions related to depression, was $.22 (p < .05)$. The magnitudes of these correlations were found by Beck, Epstein et al. (1988) to be lower than those (average $r > .50$) for other self-report measures of anxiety in their survey of literature.

In the Fydrich et al. (1990) study, the BAI was significantly correlated with the BDI ($r = .50, p < .001$) and with the mean 7-day depression rating ($r = .38, p < .01$) for the WRAD. The latter correlation was comparable to that reported by Beck, Epstein et al. (1988).

In their study of a nonclinical sample, Dent and Salkovskis (1986) reported significant correlations of the BAI with the BDI ($r = .61, p < .001$) and with the *Maudsley Obsessional-Compulsive Inventory* (MOC; Hodgson & Rachman, 1977) ($r = .41, p < .001$), as shown in Table 3. Since obsessiveness-compulsiveness is another psychopathological construct related to anxiety, measures of this construct would be expected to correlate highly with the BAI.

As Table 3 shows, the BAI was not significantly related to hopelessness as measured by the BHS (Beck & Steer, 1988); the BHS measures negative attitudes about the future, which are consistent with depression but not with anxiety (Beck, 1967, 1976; Beck & Emery, 1985).

Discriminant Validity

Although the BAI was not designed to discriminate different psychiatric diagnoses, Beck, Epstein et al. (1988) tested the instrument's ability to discriminate different combinations of primary and secondary mental disorders. They reported only moderate overlap between the BAI scores of a group with a primary anxiety disorder (and no secondary depression disorder) and another group of patients with a primary depression disorder (and no anxiety disorder). The scores of the anxiety group ($n = 82$) ranged from 2-58 (median = 24), whereas the scores of the

depression group (n = 30) ranged from 1-31 (median = 13). Approximately 25% of the anxiety group had scores higher than the highest score in the depression group.

The means and standard deviations for BAI total scores for five types of DSM-III-R anxiety disorders are presented in Table 4 (also see Table 2). A stepwise discriminant-function analysis, controlled for gender and age, indicated that the BAI total scores differentiated the type of anxiety disorder [$F(4,341) = 11.57, p < .001$]. Scheffe mean contrasts indicated that the patients diagnosed as having panic disorders described significantly ($p < .05$) more anxiety than did those with generalized anxiety or social phobia disorders. The mean BAI scores of the patients with obsessive-compulsive disorders did not differ significantly from the mean BAI scores of patients with the other four anxiety disorders. The mean levels of anxiety reported by the patients with panic disorders, with and without agoraphobia, were comparable, as were those between patients with generalized anxiety and social phobia disorders.

Table 4. Means and Standard Deviations for BAI Total Scores in Five Types of DSM-III-R Anxiety Disorders

Item	<i>n</i>	<i>M</i>	<i>SD</i>
Panic Disorder with Agoraphobia	95	27.27	13.11
Panic Disorder without Agoraphobia	93	28.81	13.46
Social Phobia	44	17.77	11.64
Obsessive-Compulsive Disorder	26	21.69	12.42
Generalized Anxiety Disorder	90	18.83	9.08

Finally, the three English nonclinical samples studied by Dent and Salkovskis (1986) had the following mean BAI scores: 65 university students, 11.08 (SD = 9.10); 142 medical students, 8.89 (SD = 7.30); and 36 nonstudents, 7.78 (SD = 5.65). These mean values are approximately half of those reported by Fydrich et al. (1990) and in this Manual for outpatients with anxiety disorders.

Factorial Validity

Using a principal-factor analysis with a promax rotation, Beck, Epstein et al. (1988) found that the BAI yielded two highly correlated ($r = .56, p < .001$) dimensions in their diagnostically mixed sample of 160 outpatients. The first factor contained symptoms such as "numbness," "feeling hot," "shaky," and "sweating," and represented predominantly somatic aspects of anxiety, whereas the second factor consisted of symptoms such as "fear of the worst happening," "terrified," and "fear of losing control," and represented both subjective and panic-related aspects of anxiety.

A centroid cluster analysis of the 21-item BAI partial-covariance matrix, with gender and age partialled out, was generated for the 393 outpatients with anxiety disorders (see Tables 2 and 5). Four clusters reflecting neurophysiological, subjective, panic, and autonomic symptoms of self-reported anxiety were found. Table 5 shows the item composition of each cluster and the corrected item-total correlations within each cluster. The first subscale included seven symptoms: "numbness," "wobbliness," "dizzy," "unsteady," "hands trembling," "shaky," and "faint." These symptoms were interpreted as reflecting the neurophysiological symptoms of anxiety. The second cluster included six symptoms: "unable to relax," "fear of the worst happening," "terrified," "nervous," "fear of losing control," and "scared"; these symptoms represented subjective aspects of anxiety. The third cluster included the symptoms of "heart pounding," "feelings of choking," "difficulty breathing," and "fear of dying." These symptoms were considered to be typical of those experienced by patients during panic attacks and, therefore, compose the panic cluster. Finally, the fourth cluster included four symptoms: "feeling hot," "indigestion," "face flushed," and "sweating." The cluster of symptoms suggested that this factor was describing primarily autonomic aspects of anxiety.

The intercorrelations of the four clusters along with coefficient alphas for each subscale are also presented in Table 5 in the diagonal of the triangular correlation matrix. All of the correlations between the clusters were significant beyond the .001 level, and the magnitudes of the coefficient alphas were adequate, given the limited number of items in each subscale.

The 393 patients were compared with respect to their four subscale scores. The means and standard deviations for the subscales created by summing the ratings for the four BAI subscales are presented in Table 6 for seven types of DSM-III-R anxiety disorders. Because there were only four patients with agoraphobia without panic attacks and two 'with posttraumatic stress disorders, patients with these disorders were combined for statistical analytical purposes with patients with anxiety disorders not otherwise specified.

A stepwise discriminant-function analysis, again controlled for gender and age, indicated that only the panic (partial $r^2 = .09$) and subjective (partial $r^2 = .07$) subscales contributed unique variance to the discriminant space differentiating the disorders [Wilks' lambda = .73, $F(24, 1337) = 5.30$, $p < .001$]. Subsequent Scheffe mean contrasts indicated that the mean panic-subscale score for patients with panic disorder without agoraphobia was higher ($p < .01$) than the mean panic-subscale scores of the patients with the generalized anxiety, social phobia,

Table 5. Corrected Item-Total Correlations for the BAI Symptom Subscales Derived from Cluster Analysis

Subscale/ BAI Item	<i>r</i>
Neurophysiological	
1. Numbness or tingling	.46
3. Wobbliness in legs	.60
6. Dizzy or lightheaded	.68
8. Unsteady	.71
12. Hands trembling	.64
13. Shaky	.74
19. Faint	.64
Subjective	
4. Unable to relax	.61
5. Fear of the worst happening	.73
9. Terrified	.72
10. Nervous	.61
14. Fear of losing control	.72
17. Scared	.71
Panic	
7. Heart pounding or racing	.47
11. Feelings of choking	.49
15. Difficulty breathing	.62
16. Fear of dying	.51
Autonomic	
2. Feeling hot	.61
18. Indigestion or discomfort in abdomen	.35
20. Face flushed	.56
21. Sweating (not due to heat)	.61

Subscale	Correlations			
	1	2	3	4
1. Neurophysiological	(.87)			
2. Subjective	.65	(.88)		
3. Panic	.59	.58	(.73)	
4. Autonomic	.60	.49	.47	(.74)

Note. N = 393. Coefficient alphas are in parentheses.

obsessive-compulsive, and simple phobia disorders. The mean panic-subscale score for patients with panic disorder with agoraphobia was also higher ($p < .01$) than the mean panic-subscale score of patients with generalized anxiety disorder.

The mean subjective-subscale score for patients with panic disorder without agoraphobia was higher ($p < .01$) than the mean subjective-subscale scores of the patients with generalized anxiety, social phobia, and simple phobia disorders. The mean subjective-subscale score for patients with simple phobia was lower ($p < .01$) than the mean scores of the patients with panic with agoraphobia, obsessive-compulsive, and generalized anxiety disorders.

Although profile analyses of BAI subscales appear promising, further research is necessary to establish the stability and reliability of clusters for diverse clinical populations.

Table 6. Corrected Item-Total Correlations for the BAI Symptom Subscales Derived from Cluster Analysis

Anxiety Disorder	BAI Subscale								
	Neurophysiological			Subjective		Panic		Automatic	
	N	M	SD	M	SD	M	SD	M	SD
Panic W/ Agoraphobia	95	7.68	5.12	10.57	4.62	4.46	2.87	4.56	2.92
Panic W/O Agoraphobia	93	7.98	5.05	11.48	4.84	5.05	3.53	4.29	3.09
Social Phobia	44	4.55	4.69	7.48	4.59	2.36	2.15	3.39	3.07
Obsessive-Compulsive	26	5.42	4.91	10.31	5.34	2.35	2.81	3.62	2.80
Generalized	90	4.60	3.69	8.63	4.14	2.51	2.13	3.09	2.16
Simple Phobia	19	1.79	2.12	3.95	2.70	1.63	1.95	1.21	1.23
Other*	26	4.23	3.90	7.54	4.23	2.65	3.05	2.77	2.30

* Includes Agoraphobia Without Panic, Posttraumatic Stress, and N.O.S. Anxiety Disorders.

Adjustments for Gender and Age

As mentioned previously, an analysis of the demographic variables of the 393 patients indicated that the BAI is significantly related to both gender and age. The canonical correlation of the set of 21 BAI items with gender (0 = Male, 1 = Female) was .30, which was significant beyond the .05 level, two-tailed test [Wilks' lambda = .91, $F(21, 370) = 1.75$]. Furthermore, the mean BAI total scores for the 236 women and 157 men were 24.14 (SD = 13.56) and 20.53 (SD = 11.86), respectively, and the mean difference of 3.6 points was significant beyond the .01 level, two-tailed test [$t(391) = 2.72$]. The women described more severe self-reported anxiety than the men did.

With respect to age, the canonical correlation between the full set of 21 BAI items and age was -.30 and significant [Wilks' lambda = .91, $F(21, 370) = 1.72$, $p < .05$]. The correlation of the BAI total scores with age ($r = -.14$, $p < .01$) was also significant. The younger outpatients reported more severe levels of anxiety than did the older outpatients.

Additional studies will have to address whether or not the magnitudes of the BAI's relationships with gender and age warrant the use of separate normative values for the BAI with different clinical populations. Researchers, however, should be aware that the BAI is significantly related to these two demographic characteristics, and possibly to other characteristics, in outpatients diagnosed as having DSM-III-R anxiety disorders, and that they might need to control for such characteristics when conducting their analyses.

Computer Software

Computer software has been developed by The Psychological Corporation in conjunction with the author. In addition to the BAI, the Beck Computer Scoring (BCS) program also scores and interprets the Beck Depression Inventory (BDI) (Beck & Steer, 1987, 1993), Beck Hopelessness Inventory (BHS) (Beck & Steer, 1988, 1993), and Beck Scale for Suicide Ideation (BSI) (Beck & Steer, 1991).

The BCS program allows three methods of inputting patient responses: On-screen administration, key-entry of paper and pencil responses, and local scanning on a desktop scanner. The BCS program includes two reporting options: A separate profile report for each Beck inventory administered, or a narrative report that integrates the results of all Beck inventories administered to the patient.

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